

MANEUVER CONTROL SYSTEM (MCS)



Army ACAT ID Program

Total Number of Systems:	3,156
Total Program Cost (TY\$):	\$1,030M
Average Unit Cost (TY\$):	\$188K
Full-rate production:	3QFY02

Prime Contractor

Block IV–Lockheed Martin

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The Maneuver Control System (MCS) is the central command and control system for the maneuver elements in battalion through corps echelons. MCS consists of a network of computer workstations that integrate information from subordinate maneuver units with those from other Army Tactical Command and Control System battlefield functional areas to create a joint common data base referred to as the Common Picture. Tactical information products, such as situation maps and reports, allow the display and manipulation of this information. MCS also provides a means to create, coordinate, and disseminate operational plans and orders. MCS' role in communicating battle plans, orders, and enemy and friendly situation reports make it a key component of the Army's ongoing effort to digitize the battlefield. As the primary command and control system from battalion to corps, MCS facilitates *dominant maneuver, precision engagement, focused logistics, and full-dimensional protection*.

BACKGROUND INFORMATION

In 1980, the Army fielded the first MCS system with limited command, control, and communications capabilities to VII Corps in Europe. In 1982, the Army awarded a five-year contract to continue MCS development, and by 1986 MCS software had evolved to Version 9, also fielded in Europe. In 1987, the Army performed post-deployment tests on Version 9 in Germany. These tests led the Army Materiel System Analysis Activity to conclude that MCS did not exhibit adequate readiness for field use and that further fielding should not occur until the problems were resolved. However, the Army awarded a second five-year contract that resulted in Version 10, which was fielded in October 1988.

In 1988, the Army awarded a contract for the development of Block III software Version 11. By 1993, the Army stopped development of software Version 11 because of program slips, design flaws, and concerns with cost growth. The program was reorganized in April 1993, forming a team of contractors and government software experts to develop software Version 12.01 using software segments salvaged from Version 11.

In September 1996, the Army awarded a contract to initiate development of the next version of MCS. This effort, the Block IV MCS, is being developed by Lockheed Martin and involves substantially different software, including the required Defense Information Infrastructure Common Operating Environment. The Army postponed IOT&E of Block III in November 1996 due to software deficiencies. In lieu of IOT&E, a Limited User Test was conducted from October-November 1996 to establish a Block III baseline and identify software problems requiring correction prior to IOT&E. This operational assessment, completed in May 1997, supported the Army's procurement of MCS for the training base prior to successful completion of IOT&E.

The Army conducted MCS Block III IOT&E in June 1998 during a Division Command Post Exercise at Ft. Hood, TX. This test included live Tactical Operations Centers (TOCs) at division, brigade, and battalion echelons equipped with 47 MCS workstations. This testing was adequate to confirm that the MCS program had achieved significant improvements in functionality since the last operational test event, as well as demonstrated the potential to provide enhanced military capability in the future digital battlefield. However, there were significant test and system limitations present, and MCS performance was marginal for several critical measures.

The most critical limitation was the lack of realistic movement and dispersion for the TOCs. A number of experimental systems installed in the TOCs of the 4th Infantry Division, which served as the test unit, were inadequately integrated or hardened for field employment—particularly for the rigors of tactical displacement. Consequently, the TOCs did not: (1) deploy to field locations; (2) disperse tactically, or (3) displace in accordance with anticipated mission profiles. In 3QFY99, when the DOT&E assessment concluded that MCS Block III was not effective or suitable, the Army decided to restructure the MCS program with Milestone III following Block IV IOT&E.

During restructuring of the Army's Battlefield Digitization Architecture, it was decided that Force XXI Battle Command, Brigade and Below (FBCB2) hardware would not be present in TOCs: situation awareness information will be processed by FBCB2 Embedded Battle Command software and command and control functions (messages, orders, overlays, etc.) will be performed by Army Battle Command Systems (ABCS) software, both hosted on ATCCS workstations. Therefore, any testing that includes units above the company level must include both ATCCS and FBCB2 systems as well as requisite interoperability between FBCB2 and ABCS software.

TEST & EVALUATION ACTIVITY

The MCS Program was scheduled to deliver Block IV Version 6.0 software for Battlefield Digitization developmental testing in November 1999, which was to be followed by operational testing of FBCB2 and MCS (along with the other ABCS systems) in April 2000. Both of these test events were downgraded as a result of immature ABCS/MCS software, and the MCS T&E Strategy and TEMP were in revision to identify replacement events throughout the remainder of the fiscal year. To date, the MCS TEMP has not been submitted for either Army or OSD review.

The proposed T&E strategy for future MCS testing includes a series of system-of-system events that will examine the performance of two hardware variants (workstations and laptops), and involve elements of the 4th Infantry Division, the 1st Cavalry Division, and III Corps. The 1st Cavalry Division role is critical because they will not possess FBCB2 at the time of testing, and it must be confirmed that MCS works well with both automated (FBCB2) and manual inputs. The final event, MCS IOT&E, will be tailored to meet remaining data requirements based on the results of all prior test events.

TEST & EVALUATION ASSESSMENT

As tested during IOT&E in June 1998, MCS Block III is not operationally effective or suitable. Although many of the Block III functions performed as designed, the evaluation identified shortfalls in the areas of data base accuracy, interoperability, logistics supportability and user acceptance, especially at lower echelons (battalion) employed with greater operational realism. Additionally, employing MCS with the realistic tactical dispersion and displacement of a dynamic battlefield is expected to further degrade operational performance.

The Army is still involved with the integration of the many software components comprising MCS Block IV. Many program managers, including some who do not report to the Army's Program Executive Officer for Command, Control, and Communication Systems, are developing these components. The complexity of the integration and configuration management of diverse software development efforts is significant, and the challenge in preparing MCS 6.0/6.1 for FY00 testing is evidence of this. Data from this testing indicate that MCS software lacks critical functionality, possesses many cumbersome workarounds, and is not sufficiently stable for the operational environment. These shortfalls caused the postponement of the FBCB2 LUT 2 in April 2000. Critical areas where ABCS/MCS failed to meet the FBCB2 LUT 2 entrance criteria included TOC server stability, transmission of situation awareness messages across brigades, development and distribution of overlays and operational orders, and management and display of the common tactical picture. Delays in the delivery of Version 6.2 functionality needed for the Army's April 2001 Division Capstone Exercise are anticipated based on the problems experienced—and that remain—with the foundational products contained in MCS 6.0 and 6.1.

Future testing of MCS must be conducted in the ABCS system-of-systems environment with division-level TOC dispersion and displacements to demonstrate the ability of MCS to maintain the common tactical picture for the maneuver force on a dynamic battlefield. The importance of movement for Tactical Operations Centers cannot be overstated, particularly with the growing emphasis that our potential adversaries are placing on disruption and destruction of our command and control capabilities, and the reliance on mobility to enhance survivability in the Army's transformation to lighter forces. The resulting vulnerabilities against such threats must also be completely assessed.

